Influence of sow dietary polyunsaturated fatty acid source on the immunoglobulin profile of piglets

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To examine the effect of different *n*-3 polyunsaturated fatty acid (PUFA) sources in sow diets on piglets' immunoglobulin (Ig) profile, two groups of twelve sows each were fed different diets from day 45 of pregnancy and during lactation on two commercial farms. On farm I, a palm oil diet (25 g/kg; PALM) and a linseed oil containing diet (20 g/kg; LIN) were fed. On farm II, the same PALM diet and a fish oil containing diet (20 g/kg; FISH) were fed. All diets contained equal amounts of C18:2*n*-6 (13 g/kg). One day before parturition, blood (for serum) was taken and shortly after parturition, colostrum was taken from the sows (not from sows on farm I) for determination of Ig levels. On day 5 *post partum* and the day before weaning, blood (for serum) was taken from 4 piglets of six sows per group (24 piglets in total per group; for 5-d old piglets on farm II, only 6 piglets of the FISH group were sampled). In all samples total IgG, IgA, IgM concentration and specific F4-IgG, -IgA and -IgM titer (Log_2 titer) against *E. coli* were determined. On farm I, the sows of the LIN group showed a trend towards lower IgG titers compared to the PALM group around farrowing ($P<0.1$). On farm II, the sows on the FISH diet showed a significantly ($P<0.05$) lower F4-IgG titer compared to the sows fed PALM. The colostrum samples on farm II showed no differences between both groups. On farm I, the 5-d old piglets from the LIN group had significantly higher IgA and IgM concentrations and higher F4-IgA and F4-IgM titers ($P<0.05$). F4-IgA and F4-IgG titers were also significantly higher at weaning in the LIN group compared to the PALM group. On farm II, the piglets of the FISH group had a significantly higher IgG concentration and F4-IgA titer ($P<0.05$) and a trend towards a higher IgM concentration ($P<0.1$) around weaning compared to the PALM group. It seems that fish oil in the maternal diet increases total IgG concentration, while linseed oil reduces total IgG and increases total IgA compared to a palm fat containing diet. Both fish and linseed oil seem to have a positive effect on total IgM concentration compared to the palm diet.

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